

### Abstract of the Disclosure

An aluminum alloy thermal exchanger has an aluminum alloy metal surface without any harmful chromium ions and having good corrosion resistance and good hydrophilicity. The thermal exchanger includes an aluminum alloy metal having a surface provided with a first protective layer of chemical conversion coating produced by using a first treatment liquid, the first treatment liquid including a water soluble vanadium compound and a fluoro-zirconium complex compound. The first protective layer has a second protective layer of hydrophilic film thereon. The second protective layer is produced by adding and drying a second treatment liquid, the second treatment liquid including an aqueous polyvinyl alcohol polymer having a vinyl alcohol unit of more than 40 mol% and another polymerization unit of less than 60 mol %, a polyoxyethylene glycol having a weight average molecular weight of 6,000 and 1,000,000, a vanadium compound, and a zirconium compound, wherein, in the second treatment liquid, the ratio of the weight % of zirconium and vanadium is 40-350.